REMARKS

This Amendment is filed in response to the Office Action dated May 14, 2007, which has a shortened statutory period set to expire August 14, 2007.

Overview of the Prior Art and the Invention

A conventional prior art system can include multiple static timing analysis (STA) tools that use various set-ups for modes and corners. See, e.g. Figure 1B, tools 100A, 100B, and 100C. Notably, as taught by Applicant in the Specification, paragraphs [0006-0007] and referring to Figure 1B:

> As STA tools 102A-102C complete their analysis, user 112 can review the results of the static timing analysis and perform debugging 113, as necessary, to mitigate timing violations. Of importance, user 112 must manually perform this user analysis/debugging 113 on results 103A-103C. Unfortunately, results 103A-103C typically form large, complex files in which each critical path in the design must be individually extracted for path profiling. Moreover, performing a comprehensive static timing analysis using available modes and corners can take many runs, e.g. 100-200 runs. Therefore, managing and/or merging the results from these runs can be very complex and time consuming.
>
> Therefore, a need arises for a system and method of efficiently managing multiple static timing analysis runs using multiple modes/corners.

Applicants provide an STA system and method that can manage multiple runs having different parameters and automatically merge the results from those runs. Specification, paragraph [0009]. Parameters can include, for example, modes and corners. Specification, paragraph [0009]. Exemplary modes can include a test mode, a normal operation mode, and a power-down mode, whereas exemplary corners can include process parameters including minimum/maximum temperatures as well as minimum/maximum voltages. Specification, paragraph [0009]. By

merging the results of such processing and extracting desired information at various levels of detail, a user can quickly and intelligently make decisions in debugging a design. Specification, paragraph [0017].

Claims 1-11, 14-38, And 41-43 Are Patentable Over Schulz

Claim 1, as amended, recites:

> merging the results [from multiple STA runs] to provide analysis coverage, path information at multiple levels of detail, and user-selected accessibility to the results, the results being organized based on at least one of modes and corners.

The Final Office Action cites various paragraphs of the section entitled "A look under the hood" as teaching the limitations of Claim 1, including the recited step of merging. Applicant respectfully submits that this section fails to teach the recited step of merging.

Referring to "A look under the hood", the first paragraph teaches that a static timing tool creates a list of all paths based on a netlist and then prunes that list based on various criteria. The second paragraph teaches that reports and various visualization tools can then provide results sorted according to user preferences. The third paragraph teaches that static timing tools support the "rich variety of features" needed to support complex designs. The fourth paragraph teaches that asynchronous clock domains should be identified and false paths eliminated so that the remaining synchronous logic can be properly analyzed. The fifth paragraph teaches that static timing tools should support reconvergent fanout, which ensures that only realistic combinations of min/max delays propagate for proper slack analysis. (Applicants note that a min/max delay result is provided from single run.) The sixth paragraph teaches that on-chip process-voltage-temperature (PVT)

variations and correlated min/max analyses are becoming important for chip-level sign off.

Notably, these paragraphs fail to disclose or suggest the recited merging of the results to provide analysis coverage, path information at multiple levels of detail, and user-selected accessibility to the results, wherein the results are organized based on modes and/or corners. Merging of the results as recited in Claim 1 advantageously allows a user to quickly and intelligently make decisions in debugging a design. Because Schulz fails to disclose or suggest this merging, Applicants request reconsideration and withdrawal of the rejection of Claim 1.

Claims 2-11 and 14-18 depend from Claim 1 and therefore are patentable for at least the reasons presented for Claim 1. Based on those reasons, Applicants request reconsideration and withdrawal of the rejection of Claims 2-11 and 14-18.

Claim 19 (amended to be in independent form) recites in part, "merging the results, wherein desired information regarding a predetermined set of modes/corners can be merged before other information". The Final Office Action cites the second paragraph of "A look under the hood" as teaching this limitation. Applicants traverse this characterization. The second paragraph teaches merely that results can be sorted according to user preferences. This teaching does not disclose or suggest merging a predetermined set of modes/corners before other information. Therefore, Applicants request reconsideration and withdrawal of the rejection of Claim 19.

Claim 20, as amended, recites in part:

> a set of automatically merged results generated by a plurality of static timing analysis runs, wherein the merged results provide analysis coverage, path information at multiple levels of detail, and user-selected accessibility to the results, the results

being organized based on at least one of modes and corners.

Therefore, Claim 20 is patentable for substantially the same reasons presented for Claim 1. Based on those reasons, Applicant requests reconsideration and withdrawal of the rejection of Claim 20.

Claims 21-24 depend from Claim 20 and therefore are patentable for at least the reasons presented for Claim 20. Based on those reasons, Applicants request reconsideration and withdrawal of the rejection of Claims 21-24.

Claim 25, as amended, recites in part:

> a third set of instructions for automatically merging the results [of multiple STA runs] to provide analysis coverage, path information at multiple levels of detail, and user-selected accessibility to the results, the results being organized based on at least one of modes and corners.

Therefore, Claim 25 is patentable for substantially the same reasons presented for Claim 1. Based on those reasons, Applicants request reconsideration and withdrawal of the rejection of Claim 25.

Claims 26-30 and 32 depend from Claim 25 and therefore are patentable for at least the reasons presented for Claim 25. Based on those reasons, Applicants request reconsideration and withdrawal of the rejection of Claims 26-33 and 32.

Claim 33 (amended to be in independent form) recites in part, "a fourth set of instructions for merging desired information regarding a predetermined set of modes/corners before merging other information". The Final Office Action cites the second paragraph of "A look under the hood" as teaching this limitation. Applicants traverse this characterization. The second paragraph teaches merely that results can be sorted according to user preferences. This

teaching does not disclose or suggest merging a predetermined set of modes/corners before other information. Therefore, Applicants request reconsideration and withdrawal of the rejection of Claim 33.

Claim 34, as amended, recites in part:

> reading sets of saved results [from each static timing analysis run] to provide analysis coverage and path information at multiple levels of detail.

The Office Action cites paragraph 2, section "A look under the hood" as teaching the recited reading limitation. Applicants respectfully traverse this characterization. The last sentence of this paragraph explicitly states, "Reports and various visualization tools can then provide results sorted according to user preferences." Nothing in this paragraph suggests that these results can provide analysis coverage and path information at multiple levels of detail. Because Schulz fails to disclose or suggest these results, Applicants request reconsideration and withdrawal of the rejection of Claim 34.

Claims 35-38 and 41-43 depend from Claim 34 and therefore are patentable for at least the reasons presented for Claim 34. Based on those reasons, Applicants request reconsideration and withdrawal of the rejection of Claims 35-38 and 41-43.

Claims 12, 13, 39 and 40 Are Patentable Over Schulz

Claims 12 and 13 depend from Claim 1, whereas Claims 39 and 40 depend from Claim 34. Therefore, Claims 12, 13, 39, and 40 are patentable for at least the reasons presented for Claims 1 and 34. Based on those reasons, Applicants request reconsideration and withdrawal of the rejection of Claims 12, 13, 39, and 40.

Moreover, Claims 12, 13, 39, and 40 recite that the saved results include intermediate results to support arbitrary

queries. The Final Office Action cites the fourth paragraph of "A look under the hood" as teaching these limitations. Applicants respectfully traverse this characterization. Specifically, the fourth paragraph teaches that asynchronous clock domains should be identified and false paths eliminated so that the remaining synchronous logic can be properly analyzed. This identification/elimination cannot be characterized as intermediate results. Therefore, Applicants request further reconsideration and withdrawal of the rejection of Claims 12, 13, 39, and 40.

Applicants Add New Claims 45-82

New Claim 45 recites in part:

> merging the results to provide path information at multiple levels of detail and user-selected accessibility to the results, the results being organized based on at least one of modes and corners.

Therefore, Claim 45 is patentable for substantially the same reasons presented for Claim 1. Claims 46-61 depend from Claim 45 and therefore are patentable for at least the reasons presented for Claim 45.

New Claim 62 recites in part:

> merging the results to provide analysis coverage, the results being organized based on at least one of modes and corners, and the analysis coverage including reporting parts of the design that are analyzed for each mode and corner

Therefore, Claim 62 is patentable for substantially the same reasons presented for Claim 1. Claims 63-78 depend from Claim 62 and therefore are patentable for at least the reasons presented for Claim 63-78.

New Claim 79 recites in part:

> a set of automatically merged results generated by a plurality of static timing analysis runs, wherein the merged results provide path information at multiple levels of detail and user-selected accessibility to the results, the results being organized based on at least one of modes and corners.

Therefore, Claim 79 is patentable for substantially the same reasons presented for Claim 1.

New Claim 80 recites in part:

> a set of automatically merged results generated by a plurality of static timing analysis runs, wherein the merged results provide analysis coverage, the results being organized based on at least one of modes and corners, and the analysis coverage including reporting parts of a design that are analyzed for each mode and corner.

Therefore, Claim 80 is patentable for substantially the same reasons presented for Claim 1.

New Claim 81 recites in part:

> a third set of instructions for automatically merging the results to provide path information at multiple levels of detail and user-selected accessibility to the results, the results being organized based on at least one of modes and corners.

Therefore, Claim 81 is patentable for substantially the same reasons presented for Claim 1.

New Claim 82 recites in part:

> a third set of instructions for automatically merging the results to provide analysis coverage, the results being organized based on at least one of modes and corners, and the analysis coverage including reporting parts of the design that are analyzed for each mode and corner.

Therefore, Claim 82 is patentable for substantially the same reasons presented for Claim 1.

CONCLUSION

Claims 1-9, 11-30, 32-43, and 45-82 are pending in the present application. Allowance of these claims is respectfully requested.

If there are any questions, please telephone the undersigned at 408-451-5907 to expedite prosecution of this case.

Respectfully submitted,

/Jeanette S. Harms/

Customer No.: 35273

Jeanette S. Harms
Attorney for Applicants
Reg. No. 35,537